

## ANSWERS TO PROBABILITY WORKSHEET-2

$$\begin{aligned} 1) \text{ a. } P(A \cup B) &= P(A) + P(B) - P(A \cap B) \\ &= 0.45 + 0.60 - 0.22 \\ &= 0.83 \end{aligned}$$

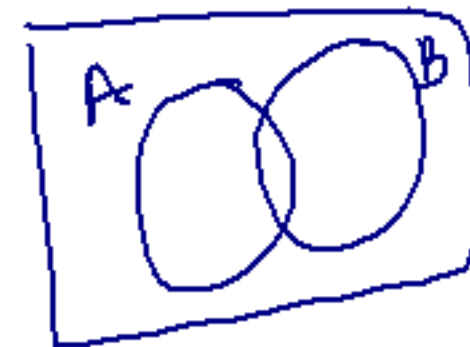
$$\text{b. } P(B|A) =>$$

$$P(A \cap B) = P(A) * P(B|A)$$

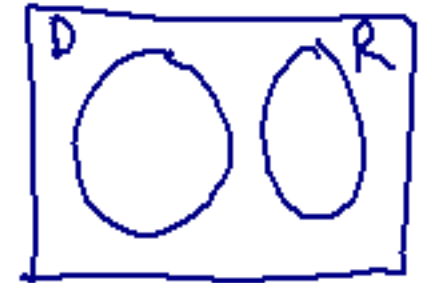
$$0.22 = 0.45 * P(B|A)$$

$$0.49 = P(B|A)$$

$$\text{c. NO! } P(A \cap B) \text{ does not} = 0$$



$$\begin{aligned}
 2. \ P(D \cup R) &= P(D) + P(R) - P(D \cap R) \\
 &= 0.32 + 0.13 - 0 \\
 &= 0.45
 \end{aligned}$$



$$P(A \cap B)$$

$$\begin{aligned}
 3. \ a. \ P(A \text{ and } B) &= P(A) * P(B|A) \\
 &= 0.51 * 0.18 \\
 &= 0.09
 \end{aligned}$$

$$P(A \cup B) =$$

$$\begin{aligned}
 b. \ P(A \text{ or } B) &= P(A) + P(B) - P(A \cap B) \\
 &= 0.51 + 0.28 - 0.09 \\
 &= 0.70
 \end{aligned}$$

4. NOTE: there are 21 numbers in the sample space

a.  $\{20\}$

b.  $1/21$

c.  $\{10,12,13,14,15,16,17,18,19,20,22,25,27,29,30\}$

d.  $3/21$

e.  $10/21$

f. 0

g.  $11/21$

h.  $\{12,13,14,15,16,17,18,19,20,22,25,27\}$

$$D^c = \{$$
$$P(D^c) =$$

For #8 on the review packet,  
assume that the probability of  
having a girl is  $\frac{1}{2}$

# Permutation/Combination notes

Perm

- Arranging  $n$  objects taking  
 $r$  @ a time

- Formula:

$${}^n P_r = \frac{n!}{(n-r)!}$$

↑                      ↑  
total                  size of  
                         group

- Order DOES matter
- More possibilities

Positions

$${}_{50}P_3 = 117,600$$

Comb = Committee

- The # of groups of  $n$  objects taken  $r$  @ a time.

Formula

$$nC_r = \frac{n!}{r!(n-r)!}$$

- Order doesn't matter
- less possibilities

Ex:

$${}_{21}nC_8 = 203,490$$



## Counting Rules

- Looking for all possible ways to combine diff. groups.

not selecting ~~a~~ out of 1 group

- $m \cdot n \cdot t$

Ex:  $3 \cdot 4 \cdot 3 \cdot 3 = 108$

$$\frac{\text{Ex. board}}{(30 \text{ nPr } 2)} \cdot \frac{\text{Ex. council}}{(28 \text{ nCr } 6)}$$

$$327,763,800$$

#3 on worksheet

③

$$\underbrace{10 \cdot 10 \cdot 10 \cdot 10 \cdot 10}_{\text{digits}} \cdot \underbrace{26 \cdot 25}_{\text{letters}} =$$